The Gage

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ABRFC

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In This Issue

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http://www.srh.noaa.gov/abrfc

ABRFC Says Farewell to Randy Tetzloff

By Diane Innes

After 37 years of service and dedication to the National Weather Service, Senior Hydrologist Randy Tezloff has retired. Randy is originally from Wisconsin. After obtaining his B.S. degree in Meteorology from the University of Wisconsin at Madison in 1965, he began his career with the NWS as a meteorologist at the former Helena, Montana office. Later, he transferred into a position which would now be comparable to the service hydrologist for the state of Montana. In 1972, Randy had the unique opportunity to further his studies in hydrology and water resource management through a NWS sponsored scholarship program. Thus, after 7 years of the Montana wilderness and weather extremes, Randy chose a more arid environment and moved to Arizona, enrolling in an advanced study program at the University of Arizona. After attending school for a year, Randy moved to Tulsa to accept a hydrologist position at the ABRFC. Randy continued to further his studies during his time at the ABRFC through Oklahoma State University's Civil Engineering graduate program. In fact, Randy has accumulated enough credits for 2 master's degrees, but he admits that he never had the desire to write the thesis required for the official diplomas.

Throughout his career, Randy has contributed greatly to the NWS. One of his more noteworthy accomplishments includes developing the PLOT-TUL Modification for OFS. For those who are not familiar with this model modification, it allows the hydrologic forecaster to plot and list data of one or more time series. This modification is useful when integrating reservoir releases in a forecast environment. In addition, Randy designed the Change Blend Routine. This routine allows the forecaster to apply a varying time modification in which the actual observations and the model solution are blended to the same level. This modification was especially useful when the hydrologic forecast programs were run centrally in Washington DC. However it is still used today, particularly when the rivers are at low flows when the developed rating curve may not be as precise. Other areas in which Randy has been influential include being a forerunner in using the "radar" estimated rainfall data in daily routine forecasting. At the time this was not a small task, considering in the early –to-mid 1990's, the river forecast centers across the nation still remotely input their data into the centralized system in Washington DC, using punch cards. Hence, unlike today, in which the model only takes a few minutes to process information, upwards of an hour would pass before a solution was transferred to the RFC. Placing this precipitation information into the model, greatly increased the potential for error and a subsequent model rerun. Consequently, many forecasters were slow to make this input a part of their routine forecasting procedures. Lastly, he has been the water supply expert at the ABRFC for the past 15 years.

(Continued on page 2)

(Continued from page 1)

As for post retirement, Randy and his wife of 32 years, Rosie, intend to remain in the Tulsa area at least in the short term. However, do not expect to catch them at home very often. They are looking forward to being able to spend more time with their daughters, Renee, 22, who is currently in Montana and Raelyn, 20, who is a sophomore at Oklahoma State University. In addition, they also plan to travel and spend more time hiking, fishing and camping. And as true outdoor enthusiasts, they hope to hike the Continental Divide trail in Montana within the next year.

Figure 1: *Friends and coworkers wishing Randy and his family farewell at his retirement party.*

Figure 2*: Randy with Jack Bowman and his wife.*

ABRFC Operational Backup Test Is Successful

by Billy Olsen

The ABRFC conducted an operational test of an RFC backup system on May 16, 2002. The test was totally successful as the system was able to host operations for a day and provide full-featured ABRFC forecast and guidance products to customers in a timely and transparent manner. The system utilizes LINUX PCs and ran independent of AWIPS. The test was structured to emulate a total loss of RFC computational capabilities as currently contained in AWIPS. The PC system ran the river forecast model 32 times faster than AWIPS (as measured in average CPU time for 10 full model cycle runs). Similar performance improvements were noted across the board for other applications. The hydrometorological situation was somewhat active in that significant rainfall was observed and two WFOs had flood watches in effect, however no flood forecasts were required. Therefore, routine daily river forecasts, flash flood guidance, hydrometorological discussion products and precipitation products were issued using the backup system. While data dissemination via Internet was flawless, some additional tweaking remains to be accomplished in order to improve data ingest via Internet. During the test, approximately 75% of the expected precipitation/river observations and radar DPA products were received. Future project tests and upgrades will involve improving current data sources, exploring alternate data sources and implementing portable computational hardware setups in order to provide backup capabilities remote from the RFC facility.

Computations are performed on a single PC with 1.8 GHz CPU, 512 Mb memory, Red Hat LINUX Version 7.2 and Informix for LINUX Version 7.31 running on the ABRFC LAN (non-AWIPS) with T1 connection to Internet. Up to four people were using the system at one time during the test by simply remotely logging into the backup PC from the LAN. Data retrieval is via Internet using programs developed by ABRFC. DPAs are retrieved via FTP from the NWSTG central product server (tgftp.nws.noaa.gov). Text products, such as HADS, COOP, and other SHEF products, are obtained from the SRH data server (www.srh.noaa.gov/data/...) by opening a raw socket connection, sending an HTTP GET request, and waiting for a response (i.e. a non-GUI Web client). Access to Mesonet/ALERT-type data is direct to the

(Continued on page 3)

(Continued from page 2)
appropriate server via FTP. An ABRFC developed program converts raw DPA (digital precipitation array) binary files from UNIX to LINUX (overcomes big endian/little endian problem) and provides the files to the process_dpa program where the standard nationally supplied radar precipitation processing software takes over. The standard ShefDecoder, OFS_DE and BatchPost routines are utilized. The ABRFC-developed P2 radar precipitation estimation software was ported and is utilized during operations (MPE was not included in this test). The ABRFC versions of xnav, xdat, xsets and fcst_prog are used for data display, quality control and product composition. D2D however is not utilized. Yet, radar reflectivity and satellite images are displayed by forecasters via Internet from their favorite web locations. QPF is entered to the river forecast model manually since NMAP is currently unavailable on LINUX systems. Since ArcView is unavailable for LINUX, the national flood outlook product was not produced on the backup system. Product dissemination is accomplished using ABRFC developed scripts which drop products on the SRH server where they are picked up by the WGRFC LDAD. They are then ingested through the LDAD into AWIPS via the standard handleOUP/ distribute Product AWIPS software used to pull other information into AWIPS.

There were a few nuisance-type bugs in programs (most were corrected as encountered) but they did not affect basic program functionality. The greatest concern identified during the test was the relatively low reliability of the Internet data feeds. However, it is encouraging to note that even though the numbers are unacceptable for the normal operational AWIPS system environment, the data ingest was sufficient to produce timely and accurate forecasts. This capability to produce operational forecasts in a backup mode did not exist prior to this test. Even more encouraging is the fact that there are items that have already been identified to improve the stability of the data ingest via Internet. We believe that the primary problem was not Internet itself or even a band-width problem, rather it was the capability or configuration of the data servers that we accessed in a "pull data" mode. For example, the DPA server often refused FTP access due to a "maximum users - connection refused" error. This is a public server and therefore it seems appropriate that the NWS offices could get a special login for operational backup purposes in order to solve the refused connection problem. Also, the SRH server often timed out during our requests for data, but then would promptly supply the next request in a timely fashion. It is expected that some tweaking on the server or client end could alleviate these difficulties. Another concern is that the backup system did not fully support all web products. However, it was felt that for the first operational test of the system that these products, such as QPE products, were not totally necessary in a backup situation. The issue of more robust support of web products will be addressed in future design considerations and operational tests.

ABRFC has not only successfully demonstrated a capability that has not been available before this time, but they have also demonstrated a very efficient and economical method to provide RFC computational backup capabilities. This method requires minimal hardware capabilities. The only significant software cost is for an Informix license. It also does not require TDY of personnel to Silver Spring for testing operational readiness or during actual backup operations.

The system will be very effective and practical for operational backup use because the system can be tested on a frequent and routine basis in actual operations. A system that is used often or on a day to day basis is a system that will be at a high state of readiness when needed. Based on the past experiences of the NWS, if a system is not maintained by the office expecting to use the backup capabilities for operations, is not useful in routine everyday operations, is not tested frequently in an operational environment or requires TDY of personnel to distant locations for both testing and use; the system will have a high risk of failure when it is required for operational backup purposes.

Future activity will focus on providing the system for use at other RFCs, improving access to current data sources, exploring alternate data sources and implementing portable computational hardware setups in order to provide backup capabilities outside the RFC facility.

Southern Region Verification Website

by Bill Lawrence

In the Fall 2001 issue of *The Gage*, the new categorical verification system developed by Southern Region hydrologists was introduced. Now, a year after the implementation of this system, the results are starting to show trends. A new website has been created to showcase these results, and can be found at http://www.srh.noaa.gov/verification/hydrology/ . This website contains the latest quarter's results for each River Forecast Center in Southern Region, as well as trends for various computed metrics. Graphics and information for previous quarters are archived on the site as well. The quarters run on the government fiscal year, which starts October 1 each year.

(Continued on page 4)

(Continued from page 3)

Some of the graphics include results for POD (Probability of Detection), FAR (False Alarm Ratio), lead times, and categorical forecast errors. Common sense dictates that higher numbers for POD and lead times are preferred, as well as lower values for FAR and categorical forecast errors. Representatives from all four Southern Region River Forecast Centers met recently, and decided to add several goals for the FY2003 operating plan. These include achieving a region -wide POD of at least 0.80 for each quarter of the upcoming year, as well as a FAR of no higher than 0.12. Finally, a goal of an average of at least 24 hours of lead time was set. All of these goals would refer to minor floods forecast through 24 hours. As more verification statistics become available, it is likely that more demanding targets will be set for the Southern Region. Below are several of the graphics available from the Southern Region hydrologic verification website.

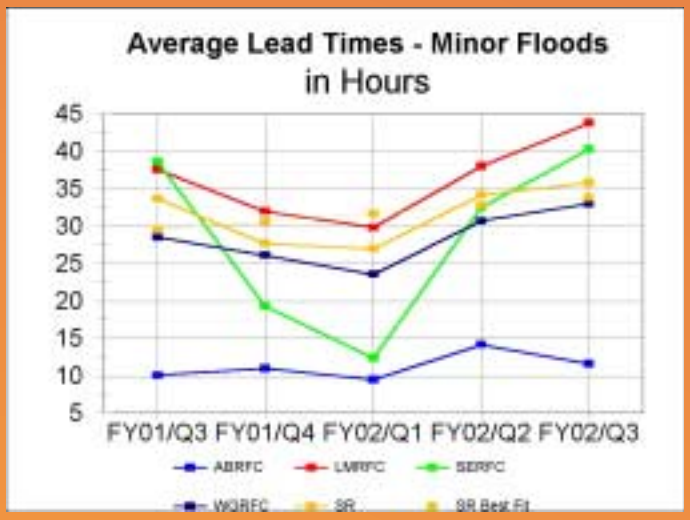

Figure 1: *The average lead time for each RFC in Southern Region for routine and flood forecast points which crested at or above minor flood stage. The period is from April 2001 through June of 2002.*

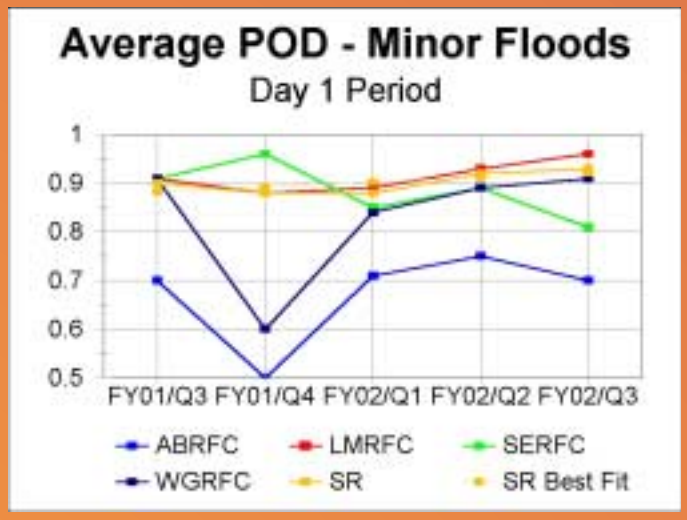

Figure 2: *The average POD for each RFC in Southern Region for locations which crested at or above minor flood stage. The period is from April 2001 through June of 2002.*

A Look at the New ABRFC Website

by Ken Pavelle

If you haven't seen our web site in the past few months, you're in for a refreshing surprise. The ABRFC site, http://www.srh.noaa.gov/abrfc, has undergone a major overhaul. The updated site provides easier access to our suite of products and information. Moreover, many of the pages have been replaced with robust, dynamically generated user interfaces.

When visiting the site, the first thing you notice is our new look. In an effort to modernize the "face" of the National Weather Service, the corporate-like style you see was developed and implemented across all NWS home pages. Although the ABRFC was one of the first NWS office to have a presence on the World Wide Web, the new look reflects our role as part of the larger organization.

The changes go much deeper than the surface. Every single page has been reviewed for content and usability. Many new pages were created; some pages were combined together; others were eliminated. Here are a few of the more significant changes:

- The **ABRFC map on the main page** now shows river status across our basin. Green points indicate sites with

(Continued on page 5)

(Continued from page 4)

daily forecasts issued. Red points indicate sites with current, non-routine forecasts (flood or action-stage forecasts). Flood frequency graphs provide the basis for the **new flood climatology** pages. (www.srh.noaa.gov/abrfc/floodclimate/index.shtml)

- **New hydrographs and hydrograph pages**. The hydrographs now include past and forecast precipitation. The hydrograph pages contain links to the text version of the forecast, the official forecasts from the local Weather Forecast Office, and to real-time data from the USGS.

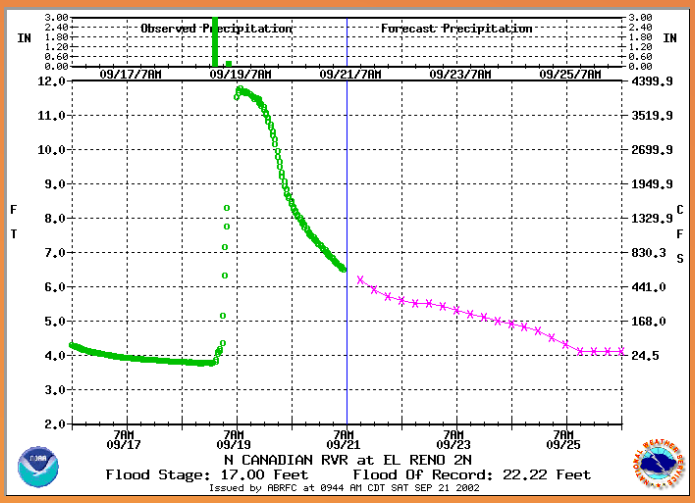

Figure 1: *Example of the new hydrograph format.*

- **Archive browser**. Previously, users had to navigate through a series of directories to find any of the 600,000+ products in our archive database. The new interface simplifies the process. Users choose the product, month and year and can also specify a range of dates or a simple search pattern. (www.srh.noaa.gov/abrfc/cgi-bin/arc_search.php)
- **New forecast verification pages**. The same data with a new presentation makes our forecast verification pages much easier to understand and use. We also added a graphic showing verification data for ever month from January 1997 to present. (www.srh.noaa.gov/abrfc/fcstver/2002/2002fcstver.shtml)
- **River photo gallery**. We improved the user interface, and added several new pictures. (www.srh.noaa.gov/abrfc/rivers.shtml)

The ABRFC web site continues to develop to meet your needs. Among the changes already planned include:

- An easy-to-use, accessibility-friendly **feedback form**.
- A new interface for ABRFC's suite of current and archived **Water Supply** products.
- A **"Research" page** highlighting the research papers, technical memoranda, and other accomplishments made by ABRFC staff.
- **Whatever you want**. ABRFC is a customer-focused office. We need you to tell us what pages you visit, what products you use or don't use, what you like or dislike, and what you want to see.

Please visit our web site at http://www.srh.noaa.gov/abrfc and let us know how we are doing. You can click on a "Contact Us" link at the bottom of every page, or simply send an email to SR-TUA.Webmaster@noaa.gov.

Figure 2: *Snapshot of the updated front page of the ABRFC Website*

Photograph on Page 1 shows a Fall Scene in Bethany, Connecticut.
Courtesy Dolores Neilson, entitled *Place of Reflection*.

Acronyms in this Edition

ABRFC – Arkansas-Red Basin River Forecast Center
ALERT – Automated Local Evaluation in Real Time
AWIPS- Advanced Weather Interactive Processing System
BS – Bachelors of Science
COOP - Cooperative Observer Program
CPU – Central Processing Unit
D2D – Display 2-Dimensional
DPA– Digital Precipitation Array
HADS – Hydrological Automated Data System
FAR – False Alarm Ratio
FTP – file transfer protocol (data transfer)
FY – Fiscal Year
GHz - Giga Hertz
GUI – graphical user interface
HTTP – HyperText Transfer Protocol
LAN - Local Area Network
LDAD – Local Data Acquisition and Dissemination
Mb-Megabyte
MPE - Multisensor Precipitation Estimator
NWS – National Weather Service
NWSTG – National Weather Service Telecommunication Gateway
OFS – Operational Forecast System
POD – Probability of Detection
RFC – River Forecast Center
SHEF – Standard Hydrologic Exchange Format
QPE – Quantitative Precipitation Estimate
QPF – Quantitative Precipitation Forecast
SRH – Southern Region Headquarters
TDY – Temporary Duty
USGS – United States Geological Survey
WFO – National Weather Service Forecast Office

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